

# **PUBLIC UTILITIES**

## **I. INTRODUCTION**

This portion of the Comprehensive Plan includes a planning-level review of the:

- Municipal Wastewater Treatment/Sanitary Sewer System
- Municipal Water System
- Municipal Storm Water System; and
- Identifies Public Utilities Policies and Recommendations.

## **II. SANITARY SEWER SYSTEM**

### **A. Existing Sanitary Sewer System**

The City of Osakis's wastewater is supported by a stabilization pond system which was placed into operation in 1965 and reconstructed and expanded in 1985. The Osakis sanitary sewer collection system is illustrated on Map 8-1. The stabilization ponds, located on the southwest side of the community just outside of city limits removes solids, organic compounds, nutrients and pathogens that have a degrading effect on natural water systems. The wastewater after treatment, is discharged into Clifford (Swims) Lake. As of September 2005, the City of Osakis provided service to 771 accounts, of which approximately 88% are residential 1% are institutional and 11% are commercial/industrial.

The wastewater treatment ponds have a capacity of 293,000 gallons per day (average annual flow average 180 day period), peak daily demand of 604,000 gallons per day (GPD) and the average daily demand for the system currently is 161,000 GPD. It is noted that this high peak demand came after a 200-year rain event.

The sanitary sewer collection system includes a network of collection pipes with eight lift stations scattered throughout the City (See Map 8-1).

According to the Public Works Director, approximately 25% of Osakis's wastewater treatment collection system consists of old clay pipes, while the remaining 75% of the pipes are 20 years old or newer. Much of the new pipe is the result of sewer replacement, new residential, commercial and industrial growth and expansion of the system.

There are a limited number of residential units in the city limits (approximately 11) that are currently serviced by individual sewage treatment systems (ISTS) and are also illustrated on Map 8-1. The City has no immediate plans to extend municipal sewer mains to these areas. Minnesota Rules Chapter 7080 governs construction and abandonment of ISTS's. The Douglas County Land & Resource office and Todd County Environmental Services offices are responsible for implementing MN Rules 7080 locally.

### **B. Future Sanitary Sewer Projections**

According to the Public Works Director and City Engineer, each person contributes an average of 101 gallons per day (GPD) or based on the average 2.3 persons per household, 232 gallons per household to the system. Using those assumptions, the available treatment capacity should be expected to serve approximately additional 569 households or 1,308 additional residents based upon the 2.3 persons per household. However, it is known that significant infiltration and inflow (I/I) is jeopardizing available capacity. As of 2005, the City was undergoing a city-wide sanitary sewer study to determine the extent and possible location of inflow and infiltration. Final results of the study are expected in late 2006.

Until the actual I/I into the system is known, the Public Works Director and City Engineer have conservatively estimated that the wastewater treatment ponds will reach capacity after the in a two to five year timeframe. Again these projections do not include capacity required to service new industrial users or commercial (retail/service) businesses nor do they account for the capacity lost due to seasonal weather conditions (rain and snow melts). It is noted that these estimates may change depending upon the type/volume of commercial/industrial users that locate within the community as well as average precipitation levels. An industry that uses high levels of water could consume the majority of the City's existing treatment capacity. For planning purposes, commercial/industrial properties may contribute 2,000 gallons per acre per day. Industrial growth, as well as actual population growth, should be monitored and sewer capacity allotted to new proposed developments accordingly.

The City currently has a number of residential subdivisions already platted, with approximately 40 vacant platted lots which, if developed with the average of 2.3 persons per household would add 92 residents. Under the current capacity restraints, the City would reach sanitary sewer treatment capacity if all existing platted lots were developed, leaving little or no capacity for new development or annexation.

It is evident that the current treatment facility in Osakis has capacity to accommodate the City of Osakis with extremely restricted growth. Due to infiltration and inflow to the system (I/I), the capacity is limited. While the City is taking steps to address the I/I, the current facilities will not be able to handle the projected population to 2030 without new or expanded facilities.

The City does not have a "Premature Subdivision" section in its Subdivision Ordinance, which allows for the denial of plats if the City is unable to service the area with municipal sewer. Land acquisition, sewer pond design approval and funding through MN Pollution Control Agency may take up to three years. The City should carefully monitor capacity and implement and exercise a premature subdivision clause.

### **C. Sanitary Sewer Plans**

A Comprehensive Sewer Plan has not been developed for the City. A Comprehensive Sewer Plan could assist the City in proactively determining sanitary sewer collection and treatment system issues and needs as the City grows as well as assist in planning for future capital expenditures.

As previously noted, the City does have areas where infiltration and inflow (I/I) occurs into the sanitary sewer system and is currently studying the extent and location of infiltration and inflow. The City may need to address the I/I through the type of manhole used, testing of all new sanitary sewer lines, prohibition and elimination of foundation lines to the sanitary sewer system, replacement of older lines and modifications to lift stations to prevent flooding. Once the sanitary sewer study is completed in 2006, the City will need to evaluate a number of options for alleviating the current I/I and take proactive measures to greatly reduce the I/I, where feasible.

There are no design standards for new sanitary sewer system improvements included in the City's subdivision ordinance. The MPCA and 10 States Standards establish and control the sanitary sewer system standards.

### **D. Maintenance of the Sanitary Sewer System**

Generally improvements have been done on an as needed basis to maintain the system. Maintenance of the older clay pipes is done through rodding of a 5 to 7 block area on an annual basis. Areas of low flow within the city are rodded every other year and the areas without manholes are jetted every year. Replacement of mains and lines are coordinated with street and other utility projects.

**E. Sanitary Sewer Rates and Fees**

Sewer rates effective in 2005 are \$4.04 for the first 1,000 gallons contributed and \$1.54 for every 1000 gallon thereafter along with a \$6.50 user fee per month. The City also charges a \$750 hookup fee at the time of building permit issuance. Rates are based on operational needs while SAC fees are based on estimated costs required to support the construction of trunk facilities to service the new growth. The City of Osakis does not currently have a designed trunk system nor charges SAC fees. The sewer system rates and fees include costs for conveyance and treatment.

Table 8-1 below compares sanitary sewer rates and fees with similar or local political jurisdictions.

**Table 8-1  
Comparison City Sewer Rates & Fees**

<b>Area</b>	<b>Residential Sewer Rate</b>	<b>Commercial/Industrial Sewer Rate</b>	<b>Sewer Access Charge (SAC) or hookup</b>	<b>Equivalency (based on average use of 7,000 gal/month)</b>
Osakis	User Fee \$6.50+ \$4.04 1 <sup>st</sup> 1000 gal; \$1.54 each 1000 gal thereafter		\$300/lot hookup	\$19.72/mo
Ashby	Base Charge \$15.00/mo + \$1.50/1000 gal		\$750 hookup fee	\$25.50/mo/mo
Henning	Base Charge \$18.00/mo + \$1.20/gal @ 1 <sup>st</sup> 2000 used		none	\$26.40/mo
Alexandria	Base Rate \$14.00/mo + \$3.10/1000 gallons of water used +\$.50 flat charge/mo		\$1000 average/lot SAC \$2500 wastewater expansion fee	\$36.20/mo
Glenwood	Base Charge \$25 + \$1.50/1000 gal		\$300/lot hookup	\$35.50/mo
Long Prairie	Base Charge \$18.00/mo +.0041/cubic feet	Base Charge various \$21.84-\$52.62/mo + .0041/cubic feet	\$50/lot hookup	\$21.84/mo
Sauk Centre	Base Charge \$5.46/mo. +\$4.70/1000 gal		\$545/lot SAC	\$38.36/mo

Capital expenses should be included in a capital improvement fund and paid for through an Enterprise Operating Fund or through the issuance of bonds and repayment from trunk area charges and/or connection fees (SAC).

As a part of new financial reporting requirements, the City may wish to create an itemized inventory of the value of each individual collection main and when each main was placed into service for the purposes of itemizing asset depreciation in conjunction with Government Accounting Standards Board (GASB) 34 directive.

**F. Proposed Sewer Facilities**

The City has not adopted a capital improvement plan (CIP) for future sewer projects and there are no sanitary sewer related capital expenditures planned. However, it is evident that upgrades

to the sewer system are needed to not only rebuild an aging collection/conveyance system but to accommodate the projected growth. This could be accommodated by increasing the capacity at the ponds or adding primary or secondary treatment facilities. The City may wish to consider the completion of a Comprehensive Sewer Plan which would not only assist the City in determining sanitary sewer collection and treatment system issues but provide recommendations for future facilities to handle the projected growth. The Plan will establish: priority replacements for mains/services; methods of financing (i.e. SAC charges, assessments, user charges) and capacity requirements and orderly improvements.

### III. WATER

#### A. Existing Water System

The City of Osakis's municipal water system serves a majority of Osakis residents and businesses with the exception of two residential private wells. The original supply and distribution system was put into place in 1908.

The City's water system includes municipal wells, storage tanks/towers and treatment facilities. It is noted that the tower located near City Hall is no longer being used. Map 8-2 illustrates the locations of these facilities. The City has two municipal wells. Well No. 1 was placed into operation in 1969 and Well No. 2 was placed into operation in 1946. Osakis draws its groundwater from a groundwater source with the two wells ranging from 114 to 129 feet deep which draw from the Quaternary Buried Artesian aquifer. The Minnesota Department of Health determined in 2004 that the Osakis source of groundwater was not particularly susceptible to contamination. Studies during that year show that no contaminants were detected at levels that violated federal drinking water standards; however, some contaminants were detected in trace amounts that were below the legal limits. Chemically, the City's water is a calcium-magnesium bicarbonate type with iron and manganese concentrations at levels slightly above secondary drinking water standards. The groundwater is chemically suitable for most purposes.

The City's water is treated at the City's water treatment facility which was constructed in 1947. Minor modifications related to operation have been completed on the plant as well as normal maintenance. The water treatment process consists of anthracite filtration for iron and manganese removal and a separate water softening process. Chlorine, fluoride and caustic sodium hydroxide are used to treat the water. The total water hardness is 34 grains (raw). Water is softened through two 85,000 gallon softeners using 25 tons of salt on a monthly basis. The water pressure is adequate at 48-53 pounds per square inch (PSI) and an additional 6 PSI available, if needed.

The pumping capacity of the two wells combined is 1,250 gallons per minute (GPM) with each well capable of pumping 650 GPM. The wells are pumped simultaneously but may be pumped separately if needed. The present average day usage for the existing system (700 connections) as estimated by the Public Works Director and City Engineer is 134,000 GPD which includes a daily softening recharge volume of 22,000 GPD. This is an average of about 83.96 gallons per capita per day (GPCD) with softening and filtered backwash or 70 GPCD without softening, based on an approximate population of 1,596 served by the system. The current maximum daily usage as estimated by the Public Works Director and City Engineer is 247,000 GPD or 155 GPCD which occurs during the watering season. Following are monthly pumping records from 2004 (in 1,000 gallons):

January	4,392 gallons	= 146,000 gpd
February	4,320 gallons	= 154,286 gpd
March	4,752 gallons	= 153,290 gpd
April	5,136 gallons	= 171,200 gpd
May	5,363 gallons	= 173,000 gpd
June	5,496 gallons	= 183,000 gpd

July	5,064 gallons	= 163,355 gpd
August	4,632 gallons	= 149,420 gpd
September	5,472 gallons	= 182,400 gpd
October	5,712 gallons	= 184,260 gpd
November	4,410 gallons	= 142,260 gpd
<u>December</u>	<u>4,119 gallons</u>	<u>= 132,870 gpd</u>
Average		145,630 gpd
		- 11,000 recharge volume = 134,630

As illustrated above, summer months, when lawn irrigation is common, pumping volumes increase.

If a property owner does abandon a private well, the City requires the abandonment of the private well or if the resident or business wishes to retain the private well for irrigation purposes, the line to the house is required to be abandoned. The State Plumbing Code requires a connection to the municipal water system if accessible, unless otherwise permitted by the local authority. The MN Department of Health standards allow residents and businesses to retain a private well system after they connect to the municipal system, provided the private well is in working order and the plumbing to the private well and municipal water system are kept separate.

The City has two elevated storage facilities, an abandoned 85,000 gallon tower and a 200,000 gallon tower, constructed in 1925 and 1996 respectively. The abandoned 85,000 gallon tower is located adjacent to City Hall on Nokomis Street and the other is located at the intersection of Main and 4<sup>th</sup> Street. The total elevated water storage available for domestic use and fire demand currently is 200,000 gallons. The Ten States Standard recommends a minimum storage capacity equal to the average daily consumption (134,000 gallons/day at peak currently) and adequate capacity to meet all fire demands as determined by the State Insurance Services Offices. Wells can also be considered as contributors to the available storage capacity if both have reliable standby emergency power systems to treat and discharge water to the system during a power outage. Emergency power generation equipment is not presently available at the water treatment plant and at city wells. Standby power could be added at the wells and treatment facility. Existing elevated storage appears to be sufficient for current demand but not for forecasted growth.

A majority of Osakis's existing water distribution system consists of water mains ranging from four to ten inches in diameter. Water main materials vary from PVC (70%) to cast iron and some sand cast iron (30%). Smaller mains (six inches or less) are primarily found within the original townsite in Osakis. The City typically requires six to eight inch mains in residential areas, eight inch mains in commercial and industrial areas and 10 inch lines for trunk lines intended to serve a larger area.

**B. Future Water Usage Projections**

Based upon present day data, the future water usage requirements for the year 2030 are estimated to be:

Average Day Demand = 619 (2030 pop. estimate increase in population) + 1,596 (existing population served by municipal drinking water system) or 2,215 X 100 (GPCD) = 221,500 GPD.

Maximum Day Demand = 619 (2030 pop. estimate increase in population) + 1,596 (existing population served by municipal drinking water system) or 2,215 X 130 (GPCD) = 287,950 GPD.

According to the Public Works Director and City Engineer, the existing iron filters are designed to handle a maximum capacity of 252,000 GPD or 175 GPM (pumps @ 650x 1,440 =936,000 GPD). The existing softners have a capacity of 82,000 gallons per recharge and are currently recharging 1&1/2 times per day. Additional softner capacity can be gained through additional recharges,

this however, takes 11,000 gallons of filtered water to recharge. Every recharge reduces filter water available for consumption. Based upon the population projections laid forth in this plan, the existing water treatment facilities would not be adequate to handle the anticipated population growth to 2030 and potentially the water distribution system in certain areas.

The "Ten States Standards" published by the Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers recommend municipal wells have a capacity equal to or exceeding the design maximum daily demand and greater than or equal to the design average day demand with the largest producing well when out of service. The existing wells when operated simultaneously at their maximum capacities are capable of producing a combined total discharge of 1,250 GPM or 1,800,000 GPD or 9000,000 GPD individually. Well capacity is adequate for future growth.

### **C. Water Utility Plans**

A Comprehensive Water Study has not been completed for the City. A Water Study would evaluate the existing municipal drinking water system and areas proposed to be serviced by municipal drinking water, include an evaluation of the existing system, identify proposed routes of water utility extension to future areas and recommend new construction routes and improvements to the existing water system to accommodate anticipated growth.

The City of Osakis has adopted the first phase of a Wellhead Protection Plan. The purpose of a Wellhead Protection Plan is to ensure the current and future safety of the City's drinking water supply and should include the following elements as required by the Minnesota Department of Health:

1. The delineation of the wellhead protection area and the drinking water supply management area.
2. An assessment of the vulnerability of the drinking water supply management area.
3. A review of expected changes to the physical environment, land use and surface and ground water sources.
4. A plan for the management of the wellhead protection area.
5. A plan to monitor the adequacy of wellhead protection measures and a plan to implement the wellhead protection plan.

### **G. Water Utility Maintenance**

The City has implemented a water utility maintenance schedule that includes flushing of hydrants on an annual basis, with dead end water mains flushed annually as well. Various water mains and service line replacement is coordinated with street and other utility projects. Every five years the well pumps are pulled and the screens are televised with mineral and scale deposits removed.

### **H. Water Rates and Fees.**

Water rates effective in 2005 were \$12.00 for the first 1,000 gallons used and \$1.45 for each gallon used thereafter. In addition, the City charged a \$300 hookup fee to developers and no water access fee (WAC). Rates are based on operational needs. Table 8-2 below compares water rates and fees with similar or local political jurisdictions. \*Note: Osakis and Henning softens the water and the other cities do not.

**Table 8-2  
Comparison City Water Rates & Fees**

<b>Community</b>	<b>Water Rate</b>	<b>Water Access Charge (WAC) or Hookup</b>	<b>Equivalency (based on average use of 7,000 gal/month)</b>
Osakis *water softening	\$12.00/1 <sup>st</sup> 1000 gal used; \$1.45 each gal thereafter	\$300/per lot hookup fee	\$20.70/mo
Henning *water softening	Base Charge Res\$28.00/mo or Comm \$34.00/mo +\$1.20/gal after 1 <sup>st</sup> 2000 gal used	none	\$34.00/mo
Ashby	Base Charge \$25.00/mo + \$3.00/1000 gal	\$750/lot hookup fee	\$46.00/mo
Alexandria	Min Base Charge \$8.40/mo, varies by meter size; \$1.59/1000 gal	\$3500/lot WAC	\$19.53/mo
Glenwood	Base Charge \$10.00/mo+ \$2.50/1000 gal	\$300/lot hookup \$250 meter	\$27.50/mo
Long Prairie	Base Charge \$10/mo +.01/ cubic feet	\$50/lot hookup \$100 meter	\$19.36/mo
Sauk Centre	Min Base Charge \$9.07/mo, varies by meter size +\$2.46/1000 gal	\$545/lot WAC \$100 meter	\$26.29/mo

**I. Proposed Water Facilities**

The City has not adopted a capital improvement plan (CIP) for future water projects. There are no water related capital expenditures planned in the next five year period. Based upon the population projections, it is evident that the current system will not be adequate to accommodate the forecasted growth and facilities will need to be upgraded. The City may wish to explore equipment which will enable the wells to pump and soften simultaneously which would allow for greater capacity. The City may also wish to consider the completion of a Comprehensive Water Plan which would assist the City in determining improvements to the existing water system to accommodate anticipated growth and aid in capital expense planning.

**V. STORM WATER UTILITY**

**A. Existing Storm Water Facilities**

Osakis's Storm Water facilities include a combination of storm sewer trunk lines, pipes, channels, manholes, overland drainage ways, catch basins and ponds.

**B. Storm Water Plans**

As of the drafting of the Comprehensive Plan, the City of Osakis has not adopted a surface water management plan. However, through the course of the development of the Comprehensive Plan, the City has expressed a desire to preserve its natural resources. The City recognizes existing natural resources including its lakes and wetlands.

To protect and perpetuate the City's natural resources and because surface water management planning will be a significant investment, it is recommended the City begin including a comprehensive surface water management plan funding line within a capital improvement program.

The surface water management plan would be used to guide the development and expansion of the City's drainage system in a cost-effective manner that preserves existing water resources. Possible goals of the surface water management plan include, but are not limited to: assessment of the current system; the identification of an ultimate storm drainage system for the entire City; reduction of public expenditures necessary to control excessive volumes and rates of runoff; flood prevention especially those urban in nature; identification of current and future drainage patterns; protection and enhancement of the areas natural habitat; promotion of ground water recharge; definition of all drainage outlets and reduction in erosion from surface flows.

In 2005, the City adopted regulations relating to erosion and sediment control. It is recommended the City also update zoning and subdivision ordinances to include standards pertaining to on-site storm water management and erosion control plan approval processes for all commercial/industrial land disturbing activities and new residential subdivisions.

The development of a surface water management plan should be initiated by the City Council. It is expected the surface water management plan would be developed by a certified engineer and approved by the Department of Natural Resources. Implementation of the surface water management plan would be achieved with assistance from the City Engineer, Planning Commission and City Council.

#### **C. Maintenance of the Storm Water System**

Storm water pipes are currently replaced in coordination with other street and utility projects. Storm water ponds, their inlets and outlets are maintained by Public Works staff. Areas included on gravel roads are jetted and vacuumed more frequently as needed and all grates are cleaned after rain events and catch basin sumps are cleaned at the same time.

#### **D. Storm Water Fees**

Existing storm water fees per month per parcel are \$1.00 for residential, \$2.50 for duplex and apartments and \$5.00 for commercial users, including daycare facilities.

### **IV. MUNICIPAL UTILITIES POLICIES AND RECOMMENDATIONS**

#### **A. Municipal Utility Objectives**

1. Continue to provide quality utility services to Osakis residents and businesses at cost effective rates.
2. Continue to plan for future utility needs and structure rates and fees to ensure future development pays for infrastructure costs needed to support the growth, focusing on SAC, WAC and connection fees.
3. Continue to upgrade existing utility infrastructure as well as plan for future extensions and improvements.

4. Manage and collect storm water to prevent flooding, erosion and contamination/destruction of water bodies, wetlands and native/aquatic species.

**B. Municipal Utility Recommendations**

1. The City should review and calculate the impact of all proposed development and land subdivision in and adjacent to city limits on the capacity of the existing sanitary sewer system to determine whether the City can provide services requested within a timely manner (i.e. two years).
2. The City should emphasize redevelopment/infill in existing urban areas to maximize existing municipal utilities.
3. The City should continually review the appropriateness of: utility rates, sewer and water availability and connection charges and trunk area charges to determine whether or not said fees are sufficient to provide for future reconstruction and expansion of the system.
4. To avoid duplicate costs the City should coordinate future street construction/reconstruction with needed municipal utility construction and reconstruction.
5. Standard review procedures should be established to ensure all (re) development within the City is in compliance with the grading and storm water management controls outlined in approved surface water management regulations or future plan.
6. The Subdivision Ordinance for the City should be updated to include a "Premature Subdivision" section, which addresses infill policies, adequacy of roads or highways servicing the development, adequacy of storm water management, safe water supply, sewage disposal, support facilities (i.e. police, fire, schools, parks, etc.), consistency with environmental protection policy and consistency with the City's capital improvement program. In addition, the Subdivision Ordinance should be updated to address design standards for utilities to be consistent with any respective comprehensive utility plans adopted by the City.
7. Upon adoption of the Wellhead Protection Plan, development proposals shall be reviewed in accordance with the Plan. Any potentially contaminating land uses sited outside the wellhead protection area.
8. The City shall coordinate extension of municipal sanitary sewer service to areas about to become urban in nature with the extension of municipal sewer service. In addition, the City should plan for the future servicing of parcels currently surrounded by City limits which are currently in the township and served with Individual Sewer Treatment Systems.
9. "Wet industries" or manufacturers which use high levels of water should be encouraged to recycle water, as the capacity of the City's treatment ponds may not be able to service the community or the user may consume a large portion of the city's remaining capacity.
10. The City may wish to consider a policy to reserve a portion of sewer system capacity specifically for the purpose of commercial/industrial development (e.g. 20% of capacity reserved for future commercial/industrial development, based on estimated usage of 2,000 gallons/acre/day) as part of a WWTF expansion project.
11. The City should produce a detailed inventory of City-owned sanitary sewer collection facilities including the value of said assets, the location of said assets, the time each asset was placed into service, the expected life of each asset and the projected timeline

for replacement, reconstruction and/or upgrading. The inventory will be beneficial for capital improvement planning purposes as well as depreciating assets.

12. The City should review assessment policies relative to development review and financing, including but not limited to cost-sharing in conjunction with extension of wastewater collection mains/lift stations in newly developing areas (i.e. City responsible only for over-sizing of mains).
13. During preliminary plat review and/or sketch plan review and prior to approval of a preliminary plat, the City should review and calculate the impact of all proposed development and land subdivision on the capacity of the existing water supply and sanitary sewer systems.
14. The City should examine the impact of private wells on existing and proposed municipal well fields as part of the wellhead protection planning process.
15. The City may wish to update the City Code to require property owners to connect to public water when it becomes available (e.g. within one to two years, continue allowing private wells in urban areas for irrigation purposes only, etc.).
16. To plan for future water supply and storage needs the City should consider the completion of a Comprehensive Water Study.